Munich Cancer Registry

- Survival
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- *Deutsch*

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C53-C55: Uterine cancer

Year of diagnosis	1998-2013
Patients	11,653
Diseases	11,705
Creation date	05/19/2015
Export date	12/30/2014
Population (females)	2.36 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C5355E.pdf

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.64 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, May 2015

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C53.-	Malignant neoplasm of cervix uteri
C53.0	Endocervix
C53.1	Exocervix
C53.8	Overlapping lesion of cervix uteri
C53.9	Cervix uteri, unspecified
C54.-	Malignant neoplasm of corpus uteri
C54.0	Isthmus uteri
C54.1	Endometrium
C54.2	Myometrium
C54.3	Fundus uteri
C54.8	Overlapping lesion of corpus uteri
C54.9	Corpus uteri, unspecified
C55	Malignant neoplasm of uterus, part unspecified

INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	482	19	3.9	25.9	51.9	94.8	
1999	498	19	3.8	23.9	49.2	96.4	
2000	467	20	4.3	24.0	45.6	97.0	
2001	502	26	5.2	24.5	49.8	94.6	
2002	759	47	6.2	21.6	46.5	96.6	#
2003	764	52	6.8	23.7	45.8	94.4	
2004	755	48	6.4	22.8	44.9	95.9	
2005	793	37	4.7	21.6	40.4	93.8	
2006	749	25	3.3	18.7	35.8	91.5	
2007	874	45	5.1	21.7	39.7	80.2	# ##
2008	898	33	3.7	21.0	34.6	57.8	
2009	879	27	3.1	20.0	31.9	56.5	
2010	839	40	4.8	20.9	30.4	57.3	
2011	864	24	2.8	19.9	25.0	58.1	
2012	856	45	5.3	23.2	23.8	61.6	
2013	726	34	4.7	18.2	15.2	98.3	###
1998-2013	11705	541	4.6	21.7	36.8	80.4	

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	482	41.0	22.8	31.3	36.7
1999	498	42.0	23.0	31.5	36.9
2000	467	38.9	21.4	29.4	34.5
2001	502	41.3	22.4	30.8	36.2
2002	759	38.8	20.8	28.5	33.5
2003	764	38.8	20.4	28.4	33.2
2004	755	38.2	19.9	27.8	32.6
2005	793	39.9	21.2	29.0	33.5
2006	749	37.3	19.8	27.1	31.6
2007	874	37.8	20.1	27.7	32.1
2008	898	38.7	20.5	28.1	32.5
2009	879	37.8	20.4	27.9	32.0
2010	839	35.8	18.4	25.5	30.0
2011	864	36.6	19.3	26.5	30.7
2012	856	36.3	18.3	25.4	29.9
2013	726	30.8	16.1	22.2	26.1
1998-2013	11705	37.7	20.0	27.5	32.0

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	482	63.5	14.6	23.8	95.5	42.8	53.6	64.2	74.5	82.5
1999	498	63.3	15.8	24.4	99.9	39.5	52.8	64.3	75.3	83.1
2000	467	62.9	14.9	23.9	93.1	40.3	53.7	63.5	75.1	80.7
2001	502	64.1	15.1	26.3	96.0	41.3	54.4	64.4	75.0	82.6
2002	759	64.2	15.1	25.9	96.1	41.1	54.7	65.6	75.8	82.6
2003	764	65.3	14.6	27.3	99.4	44.1	56.1	65.3	76.3	83.6
2004	755	65.0	14.6	21.0	99.8	43.6	55.7	65.8	76.2	83.1
2005	793	64.5	14.8	24.0	100	41.8	55.4	66.2	74.1	83.6
2006	749	64.3	15.2	22.9	99.4	42.5	54.0	65.5	75.3	83.6
2007	874	64.1	14.9	22.0	99.2	42.1	54.6	66.2	74.8	82.7
2008	898	64.1	14.5	24.0	97.1	43.6	53.9	66.6	73.8	82.6
2009	879	64.1	14.9	23.1	102	42.1	54.3	65.1	74.4	83.0
2010	839	65.0	14.9	25.1	98.7	43.5	54.6	67.0	75.8	84.1
2011	864	64.1	15.0	25.7	95.6	42.4	53.8	66.6	74.7	83.3
2012	856	65.7	14.7	0.3	97.8	45.0	56.1	67.9	76.0	83.9
2013	726	64.5	15.2	22.1	97.1	43.2	54.4	65.8	76.3	83.2
1998-2013	11705	64.4	14.9	0.3	102	42.7	54.6	65.8	75.2	83.2

Table 4

Age distribution by 5-year age group for period 1998-2013
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	0	0.0	0.0
10-14	0	0.0	0.0
15-19	0	0.0	0.0
20-24	13	0.1	0.1
25-29	107	0.9	1.0
30-34	266	2.3	3.3
35-39	461	3.9	7.2
40-44	626	5.3	12.6
45-49	674	5.8	18.4
50-54	878	7.5	25.9
55-59	1147	9.8	35.7
60-64	1430	12.2	47.9
65-69	1561	13.3	61.2
70-74	1567	13.4	74.6
75-79	1179	10.1	84.7
80-84	942	8.0	92.7
85+	853	7.3	100.0
All ages	11705	100.0	

Included in the statistics are 25.5% multiple primaries.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 1998-2013

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=539 %	Prop. all cancers n=153136 %
0- 4	1	0.1	100.0	0.4
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	13	0.7		2.5
25-29	106	5.2		9.6
30-34	266	12.0		12.9
35-39	461	19.5	0.2	12.3
40-44	625	25.1	0.5	10.0
45-49	668	28.9	1.5	7.6
50-54	877	42.7	0.7	7.9
55-59	1146	59.6	1.0	8.4
60-64	1429	76.2	1.0	8.3
65-69	1557	90.2	1.5	8.2
70-74	1560	102.8	3.1	8.5
75-79	1177	99.1	6.5	6.7
80-84	940	100.8	11.7	6.0
85+	850	95.1	27.8	4.9
All ages	11676		4.6	7.6
Incidence				
Raw		37.6		
WS		19.9		
ES		27.4		
BRD-S		32.0		

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

Table 6

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	2.2	2.2	0.7	5.2		0.8	
C09-C10	Oropharynx	4	1.5	2.6	0.7	6.7		0.7	
C15	Oesophagus	2	2.1	0.9	0.1	3.4		-0.0	
C16	Stomach	15	13.5	1.1	0.6	1.8		0.4	20.0
C17	Small intestine	8	1.7	4.6	2.0	9.1	#	1.8	
C18	Colon	86	37.1	2.3	1.9	2.9	#	13.7	10.5
C19-C20	Rectum	34	16.3	2.1	1.4	2.9	#	5.0	14.7
C21	Anus/canal	7	2.0	3.6	1.4	7.3	#	1.4	14.3
C22	Liver	7	4.2	1.7	0.7	3.4		0.8	14.3
C23-C24	Bile	9	5.4	1.7	0.8	3.2		1.0	11.1
C25	Pancreas	35	15.9	2.2	1.5	3.1	#	5.3	31.4
C26	GI cancer	4	0.7	6.1	1.7	15.7	#	0.9	50.0
C33-C34	Lung	85	26.1	3.3	2.6	4.0	#	16.5	11.8
C38,C45	Mesothelioma	3	0.7	4.4	0.9	13.0		0.6	
C43	Malign. melanoma	19	13.6	1.4	0.8	2.2		1.5	
C46,C49	Soft tissue	12	2.1	5.7	2.9	9.9	#	2.8	
C48	Peritoneal	5	1.3	3.8	1.2	8.8	#	1.0	
C50	Breast	252	115.4	2.2	1.9	2.5	#	38.2	4.0
C51	Vulva	12	3.5	3.4	1.7	5.9	#	2.4	8.3
C52	Vagina	10	0.7	14.3	6.9	26.3	#	2.6	
C53	Cervix uteri	14	5.4	2.6	1.4	4.3	#	2.4	50.0
C54	Corpus uteri	18	21.1	0.9	0.5	1.4		-0.9	27.8
C55,C57	Fem. genitals un	2	0.9	2.3	0.3	8.4		0.3	100.0
C56	Ovary	168	15.6	10.8	9.2	12.5	#	42.6	13.1
C64	Kidney	16	9.3	1.7	1.0	2.8		1.9	6.3
C65	Renal pelvis	6	1.1	5.4	2.0	11.8	#	1.4	
C67	Bladder	19	6.8	2.8	1.7	4.3	#	3.4	15.8
C70-C72	CNS cancer	9	5.3	1.7	0.8	3.3		1.0	22.2
C73	Thyroid	15	7.1	2.1	1.2	3.5	#	2.2	
C76-C79	CUP	14	6.5	2.2	1.2	3.6	#	2.1	7.1
C81	Hodgkin lymphoma	3	0.7	4.1	0.8	11.8		0.6	
C82-C85	NHL	27	14.3	1.9	1.2	2.7	#	3.5	3.7
C90	Mult. myeloma	2	4.6	0.4	0.1	1.6		-0.7	50.0
C91-C96	Leukaemia	13	5.9	2.2	1.2	3.8	#	2.0	30.8
Other primaries		9	4.3	2.1	1.0	3.9		1.3	
Not observed		0	2.0	0.0	0.0	1.9		-0.5	
All mult. primaries		949	376.8	2.5	2.4	2.7	#	160.1	10.9

Patients	7790
Median age at second malignancy (years)	70.7
Person-years	35749
Mean observation time (years)	4.6
Median observation time (years)	3.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".

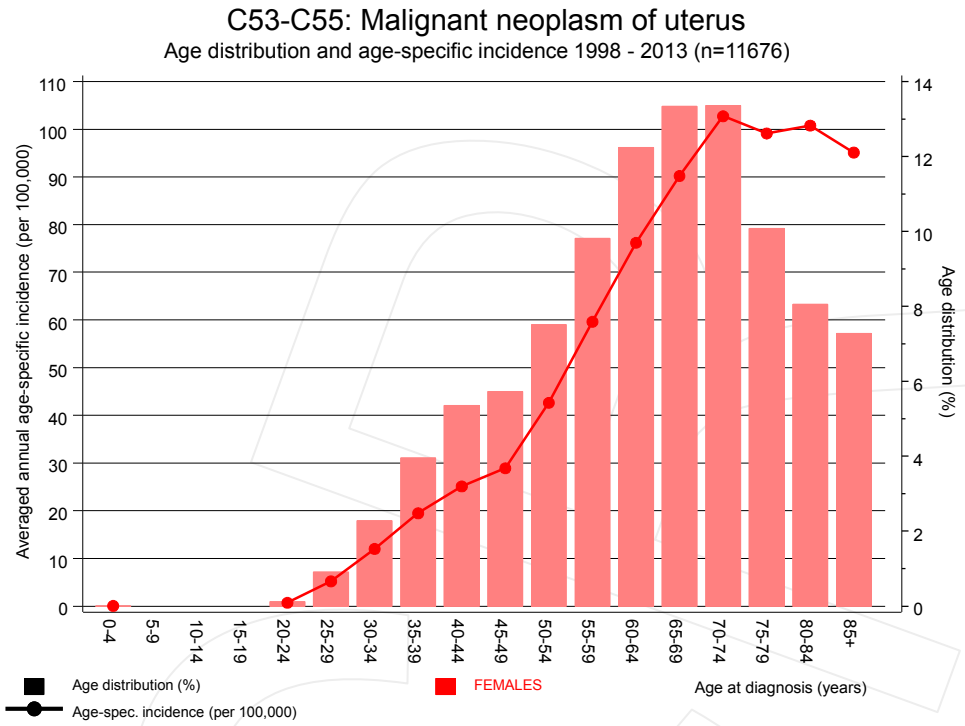

Figure 7. Age distribution and age-specific incidence

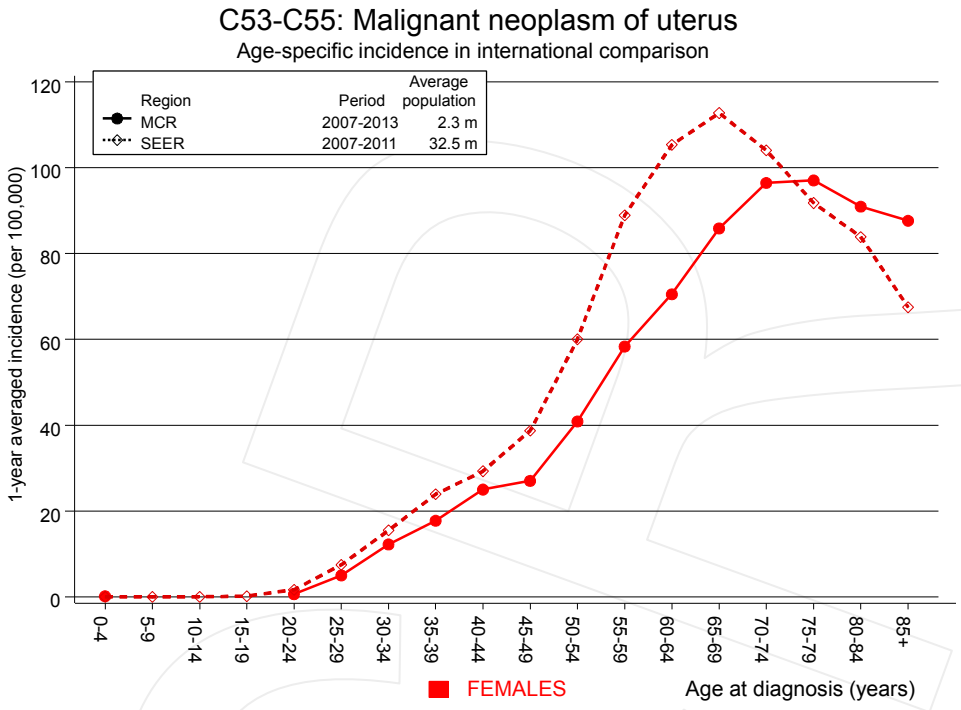

Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

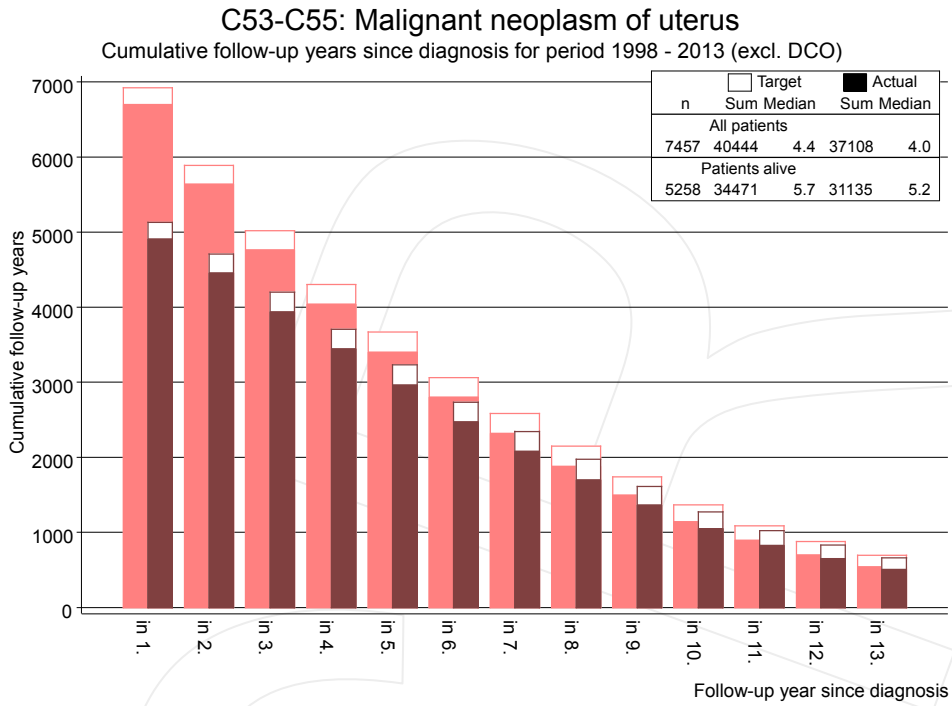

Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.

Average incidence (world standard population) 2007 - 2013

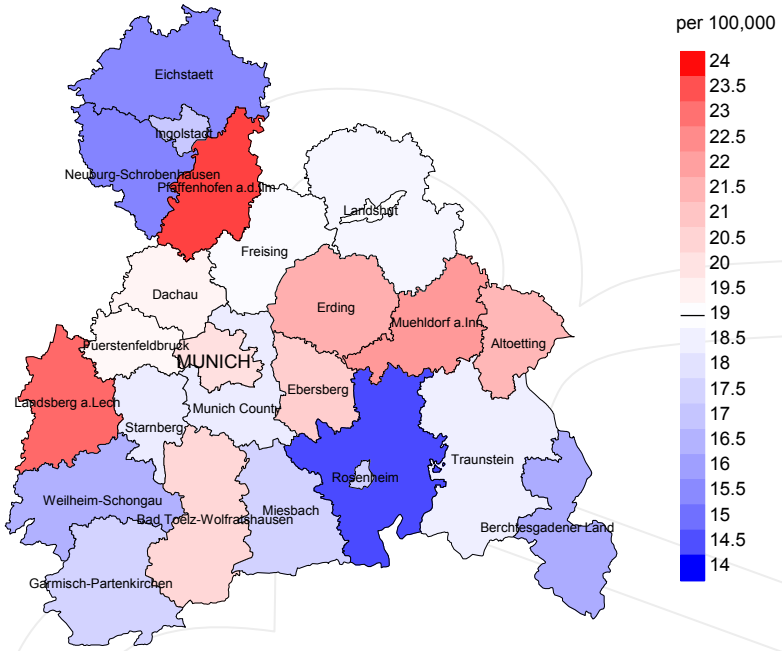

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (19.0/100,000 WS N=5,919).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 177 women were identified with newly diagnosed uterine cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 20.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 16.7 and 25.5/100,000.

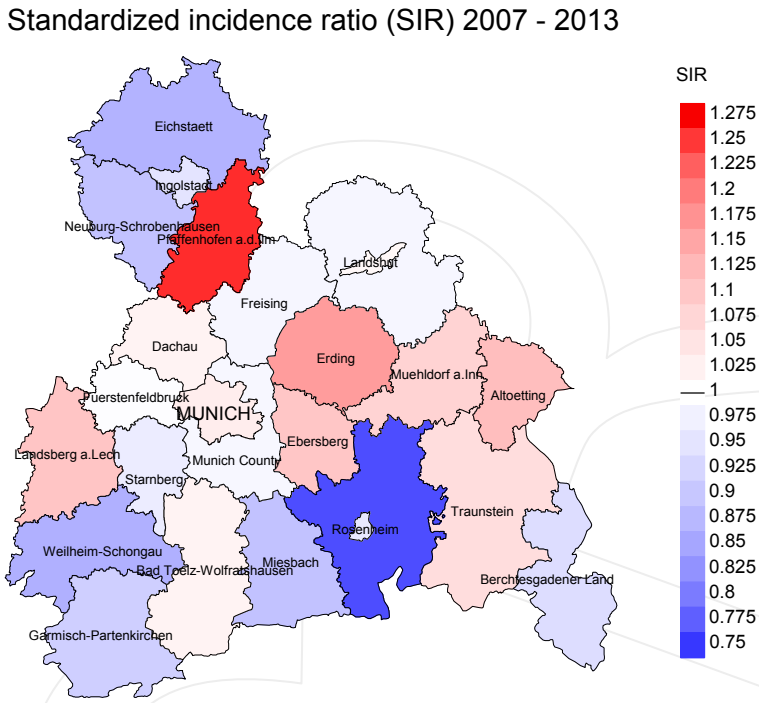

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=5,919).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 177 women were identified with newly diagnosed uterine cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.90 and 1.33, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	482	94.8	3.9	250	51.9	90.4
1999	498	96.4	3.8	245	49.2	93.1
2000	467	97.0	4.3	213	45.6	95.8
2001	502	94.6	5.2	250	49.8	94.4
2002	759	96.6	6.2	353	46.5	96.0
2003	764	94.4	6.8	350	45.8	97.1
2004	755	95.9	6.4	339	44.9	97.1
2005	793	93.8	4.7	320	40.4	95.6
2006	749	91.5	3.3	268	35.8	98.9
2007	874	80.2	5.1	347	39.7	96.8
2008	898	57.8	3.7	311	34.6	98.7
2009	879	56.5	3.1	280	31.9	97.9
2010	839	57.3	4.8	255	30.4	97.6
2011	864	58.1	2.8	216	25.0	95.8
2012	856	61.6	5.3	204	23.8	98.0
2013	726	98.3	4.7	110	15.2	89.1
1998-2013	11705	80.4	4.6	4311	36.8	96.1

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	482	238	89.5	44	9.1
1999	498	256	91.4	45	9.0
2000	467	266	92.9	47	10.1
2001	502	229	91.7	43	8.6
2002	759	387	95.6	82	10.8
2003	764	467	96.4	93	12.2
2004	755	423	96.9	82	10.9
2005	793	438	95.0	72	9.1
2006	749	416	96.2	55	7.3
2007	874	493	97.0	93	10.6
2008	898	488	98.8	71	7.9
2009	879	516	99.0	70	8.0
2010	839	527	98.9	81	9.7
2011	864	579	97.4	81	9.4
2012	856	530	98.5	102	11.9
2013	726	586	98.5	80	11.0
1998-2013	11705	6839	96.6	1141	9.7

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	238	57.1	42.9	77.0
1999	256	60.5	39.5	75.2
2000	266	59.0	41.0	72.1
2001	229	50.2	49.8	72.9
2002	387	62.8	37.2	76.5
2003	467	64.5	35.5	77.1
2004	423	63.8	36.2	74.1
2005	438	63.7	36.3	74.8
2006	416	59.6	40.4	71.8
2007	493	62.3	37.7	70.7
2008	488	62.1	37.9	69.7
2009	516	58.9	41.1	67.3
2010	527	63.9	36.1	72.2
2011	579	61.3	38.7	70.4
2012	530	59.6	40.4	69.2
2013	586	60.1	39.9	68.1
1998-2013	6839	61.1	38.9	71.9

Table 11

Medians of age at death according to the grouping in Table 10

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	238	77.6	71.7	82.2	76.3
1999	256	79.3	76.2	84.3	78.9
2000	266	79.8	77.1	83.1	78.0
2001	229	79.9	74.5	82.3	77.6
2002	387	79.3	73.8	84.6	75.8
2003	467	78.5	74.2	83.6	76.4
2004	423	78.4	73.3	84.5	75.1
2005	438	80.1	74.1	84.2	76.8
2006	416	79.7	74.5	85.5	76.2
2007	493	81.2	74.4	85.9	77.2
2008	488	79.8	72.5	85.8	74.7
2009	516	80.1	73.4	85.9	75.1
2010	527	79.8	73.8	85.6	75.5
2011	579	79.5	74.1	85.7	75.2
2012	530	80.5	76.1	86.9	77.0
2013	586	79.9	74.2	86.6	76.0
1998-2013	6839	79.6	74.2	85.0	76.3

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 12

Mortality measures (cancer-related death) and mortality-incidence-index by year of death

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	136	11.6	0.28	5.3	0.23	7.7	0.25	9.9	0.27
1999	155	13.1	0.31	5.3	0.23	8.1	0.26	10.9	0.30
2000	157	13.1	0.34	5.1	0.24	7.9	0.27	10.8	0.31
2001	115	9.5	0.23	4.0	0.18	5.9	0.19	7.8	0.22
2002	243	12.4	0.32	5.3	0.25	7.9	0.28	10.2	0.30
2003	301	15.3	0.39	6.4	0.32	9.7	0.34	12.5	0.38
2004	270	13.7	0.36	5.8	0.29	8.7	0.31	11.1	0.34
2005	279	14.0	0.35	5.6	0.26	8.4	0.29	10.8	0.32
2006	248	12.3	0.33	4.9	0.25	7.4	0.27	9.7	0.31
2007	307	13.3	0.35	5.2	0.26	7.8	0.28	10.1	0.31
2008	303	13.1	0.34	5.4	0.27	8.0	0.28	10.2	0.31
2009	304	13.1	0.35	5.3	0.26	7.8	0.28	10.0	0.31
2010	337	14.4	0.40	5.8	0.31	8.5	0.33	10.8	0.36
2011	355	15.0	0.41	5.9	0.30	8.8	0.33	11.2	0.37
2012	316	13.4	0.37	4.9	0.27	7.6	0.30	10.0	0.34
2013	353	15.0	0.49	5.8	0.36	8.7	0.39	11.4	0.44
1998-2013	4179	13.5	0.36	5.4	0.27	8.1	0.30	10.5	0.33

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
20-24	1	0.0	0.0
25-29	6	0.1	0.2
30-34	20	0.5	0.6
35-39	53	1.3	1.9
40-44	110	2.6	4.5
45-49	143	3.4	7.9
50-54	180	4.3	12.2
55-59	261	6.2	18.3
60-64	333	7.9	26.2
65-69	494	11.7	37.9
70-74	585	13.9	51.8
75-79	604	14.3	66.1
80-84	661	15.7	81.8
85+	769	18.2	100.0
All ages	4220	100.0	

Included in the statistics are 25.5% multiple primaries.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.08	2.0
25-29	6	0.3	0.06	5.2
30-34	20	0.9	0.08	8.8
35-39	53	2.2	0.11	10.3
40-44	110	4.4	0.18	9.7
45-49	143	6.2	0.21	7.1
50-54	180	8.8	0.21	5.8
55-59	261	13.6	0.23	5.5
60-64	333	17.8	0.23	5.1
65-69	494	28.6	0.32	5.9
70-74	585	38.5	0.37	5.9
75-79	604	50.9	0.51	5.6
80-84	661	70.9	0.70	5.9
85+	769	86.0	0.90	5.6
All ages	4220			5.8
Mortality				
Raw		13.6	0.36	
WS		5.5	0.27	
ES		8.2	0.30	
BRD-S		10.6	0.33	
PYLL-70				
per 100,000		72.2		
ES		61.5		
AYLL-70		12.0		

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15

Multiple primaries in deaths in period 1998-2013

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	60	2.8	4	6.7	4	6.7	52	86.7
C18	Colon	196	9.2	46	23.5	16	8.2	134	68.4
C19-C20	Rectum	121	5.6	33	27.3	2	1.7	86	71.1
C21	Anus/canal	22	1.0	5	22.7			17	77.3
C23-C24	Bile	28	1.3	3	10.7			25	89.3
C25	Pancreas	76	3.5	1	1.3	3	3.9	72	94.7
C33-C34	Lung	203	9.5	16	7.9	11	5.4	176	86.7
C43	Malign. melanoma	50	2.3	26	52.0	1	2.0	23	46.0
C44	Skin others	57	2.7	26	45.6	4	7.0	27	47.4
C50	Breast	490	22.9	238	48.6	44	9.0	208	42.4
C51	Vulva	38	1.8	4	10.5	6	15.8	28	73.7
C52	Vagina	30	1.4	2	6.7	8	26.7	20	66.7
C53	Cervix uteri	25	1.2			2	8.0	23	92.0
C54	Corpus uteri	31	1.4			5	16.1	26	83.9
C56	Ovary	203	9.5	20	9.9	97	47.8	86	42.4
C64	Kidney	41	1.9	13	31.7	4	9.8	24	58.5
C67	Bladder	106	4.9	15	14.2	11	10.4	80	75.5
C70-C72	CNS cancer	41	1.9	10	24.4	2	4.9	29	70.7
C76-C79	CUP	38	1.8	5	13.2	1	2.6	32	84.2
C82-C85	NHL	44	2.1	10	22.7	3	6.8	31	70.5
C91-C96	Leukaemia	52	2.4	6	11.5	4	7.7	42	80.8
Other primaries		190	8.9	40	21.1	12	6.3	138	72.6
All mult. primaries		2142	100.0	523	24.4	240	11.2	1379	64.4

Multiple primaries with number of cases 1 to 19 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Singular primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.08	2.1
25-29	6	0.3	0.06	5.5
30-34	16	0.7	0.06	8.0
35-39	51	2.2	0.11	10.9
40-44	102	4.1	0.18	10.3
45-49	123	5.3	0.21	7.1
50-54	151	7.3	0.20	5.8
55-59	228	11.9	0.22	5.7
60-64	282	15.0	0.23	5.3
65-69	391	22.7	0.29	5.8
70-74	481	31.7	0.37	6.1
75-79	497	41.8	0.52	5.8
80-84	536	57.5	0.71	6.0
85+	629	70.4	0.94	5.7
All ages	3494			6.0
Mortality				
Raw		11.2	0.35	
WS		4.6	0.26	
ES		6.8	0.29	
BRD-S		8.8	0.32	
PYLL-70				
per 100,000		63.0		
ES		53.7		
AYLL-70		12.4		

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Single primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.08	2.3
25-29	6	0.3	0.06	5.8
30-34	16	0.7	0.06	8.8
35-39	48	2.0	0.11	11.3
40-44	94	3.8	0.17	10.3
45-49	107	4.6	0.19	6.9
50-54	123	6.0	0.17	5.3
55-59	179	9.3	0.19	5.0
60-64	218	11.6	0.19	4.7
65-69	280	16.2	0.23	4.9
70-74	316	20.8	0.28	4.8
75-79	319	26.9	0.37	4.4
80-84	327	35.1	0.47	4.4
85+	428	47.9	0.69	4.5
All ages	2462			4.9
Mortality				
Raw		7.9	0.27	
WS		3.4	0.21	
ES		5.0	0.23	
BRD-S		6.3	0.25	
PYLL-70				
per 100,000		53.5		
ES		45.6		
AYLL-70		13.2		

* See corresponding tables with multiple primaries.

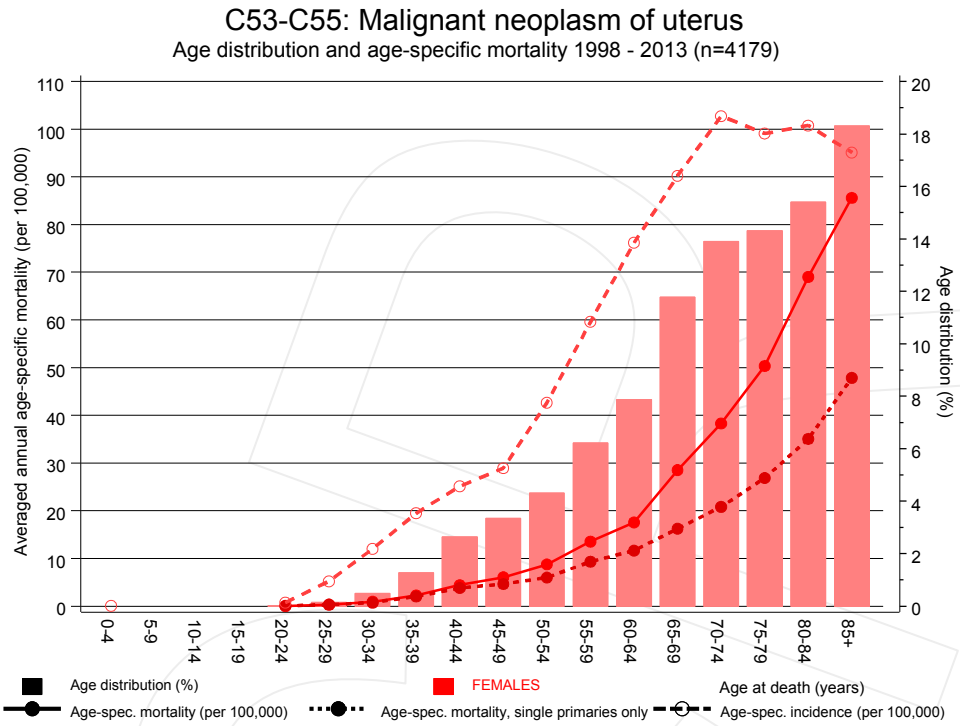

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at uterine cancer-related death (see Table 10) should be considered.

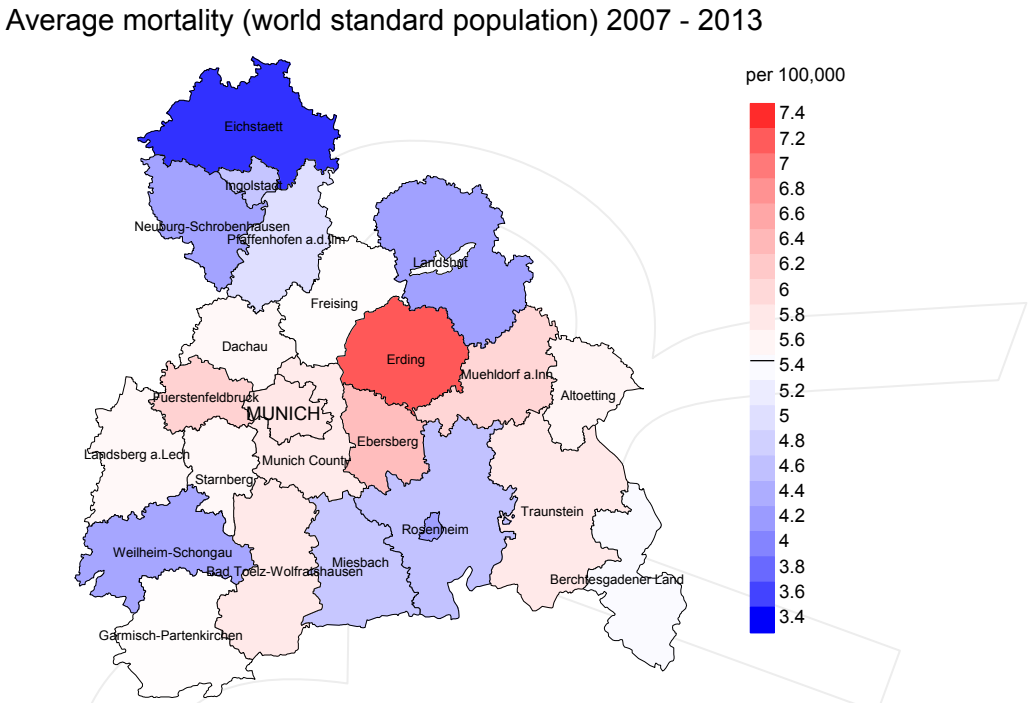

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (5.5/100,000 WS N=2,259).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 69 women died from uterine cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 6.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.4 and 8.9/100,000.

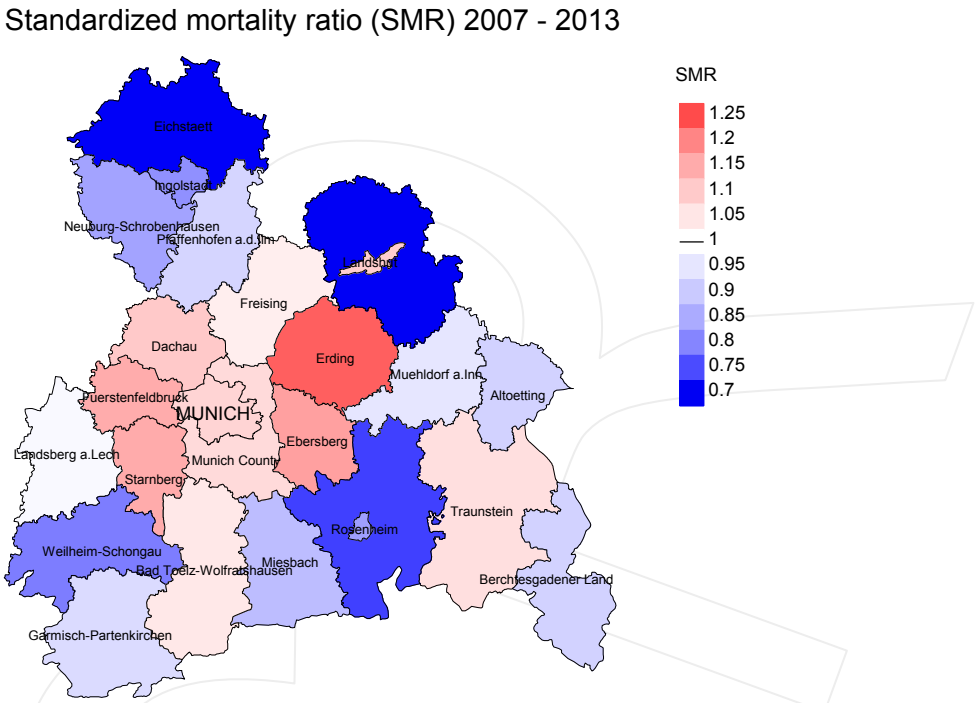

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=2,259).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 69 women died from uterine cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.16. Though, the value of this parameter may vary with an underlying probability of 99% between 0.84 and 1.58, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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